Communication Flow Key

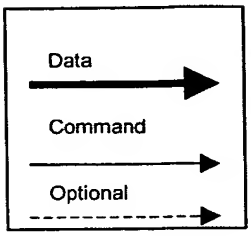


Figure 1. System Architecture

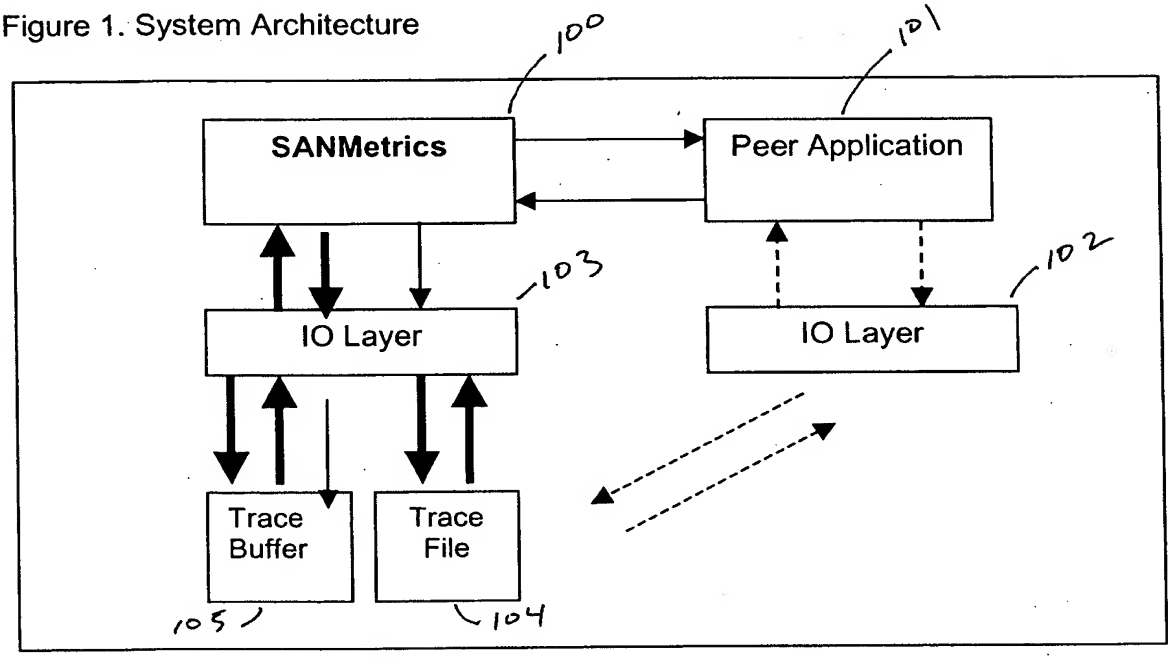


FIGURE 1

Figure 2. SANMetrics Architecture

100

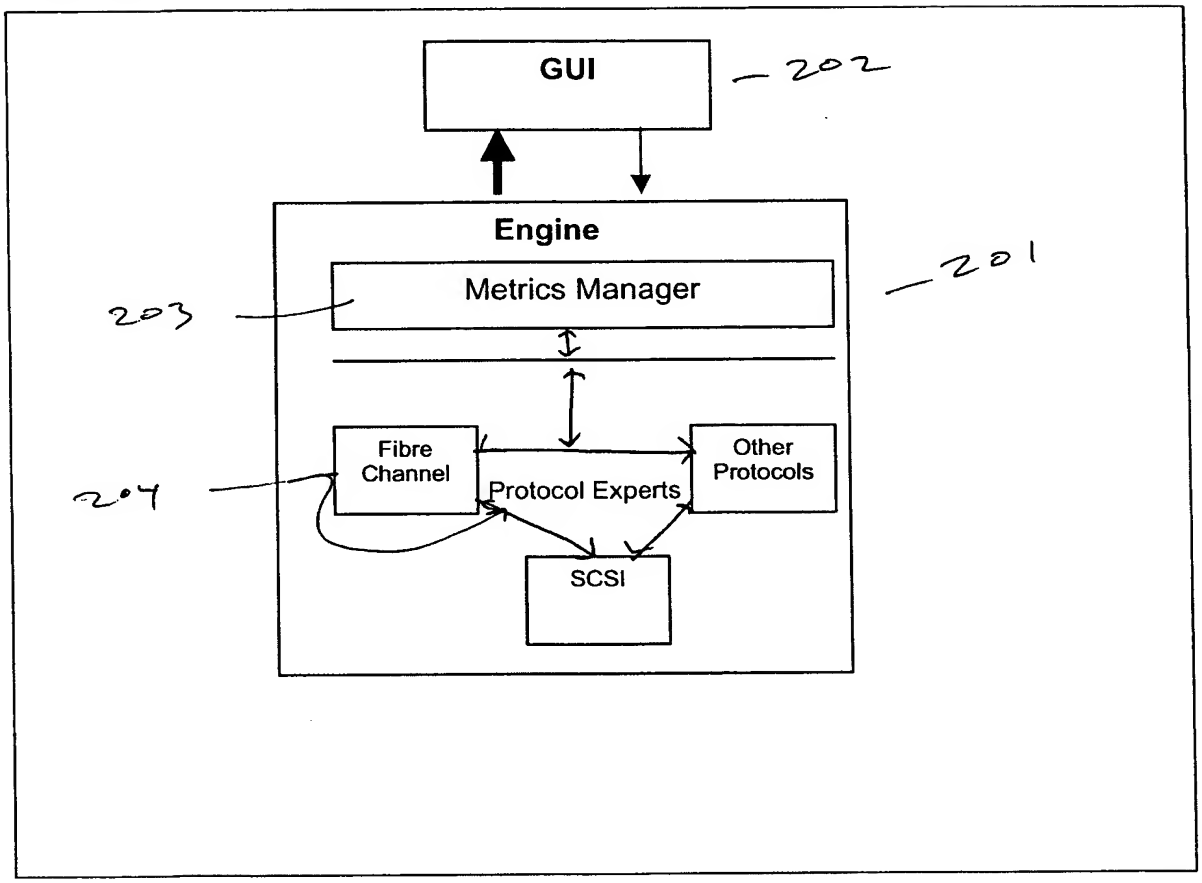
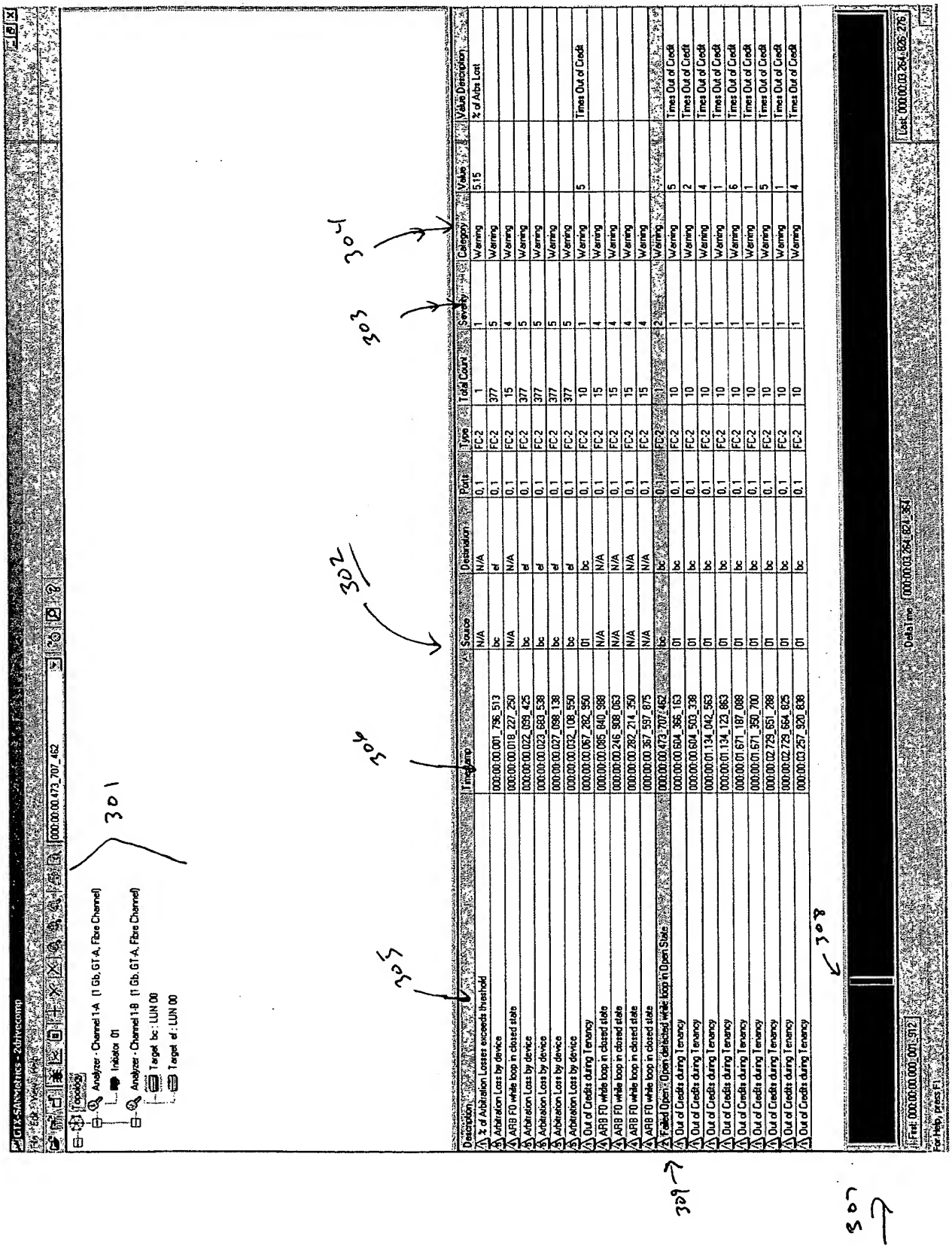


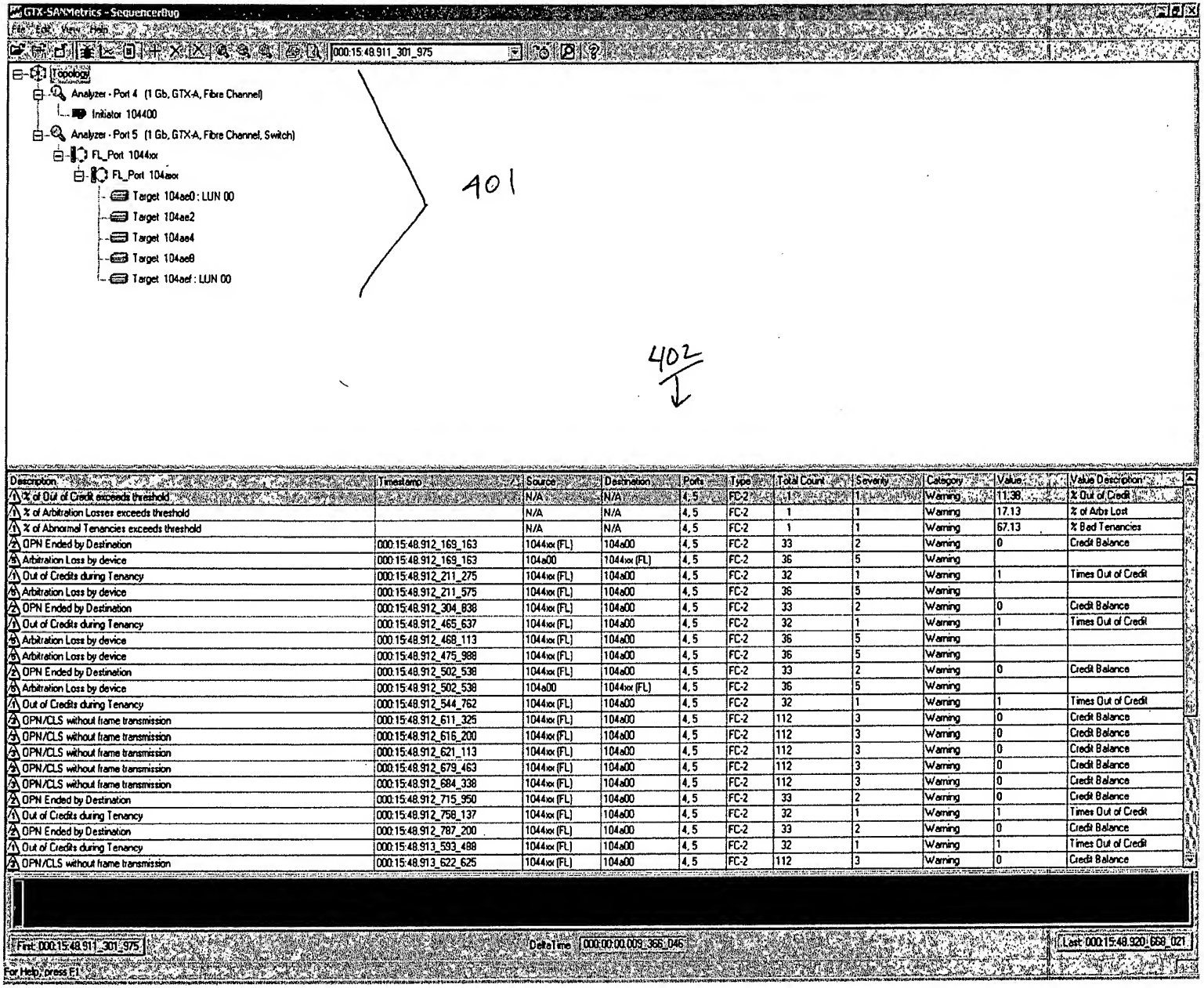
FIGURE 2

FIGURE 3


300
301
302
303
304
305
306
307
308
309
Description
Timestamp
Source
Destination
Ports
Type
Total Count
Severity
Category
Value
Value Description
% of Arbs Lost
Times Out of Credit
Warning
Analyzer - Channel 1-A (1 Gb, GT-A, Fibre Channel)
Initiator 01
Analyzer - Channel 1-B (1 Gb, GT-A, Fibre Channel)
Target bc : LUN 00
Target ef : LUN 00

400

FIGURE 4



Description	Timestamp	Source	Destination	Ports	Type	Total Count	Severity	Category	Value	Value Description
% of Out of Credit exceeds threshold		N/A	N/A	4, 5	FC-2	1	1	Warning	11.38	% Out of Credit
% of Arbitration Losses exceeds threshold		N/A	N/A	4, 5	FC-2	1	1	Warning	17.13	% of Arbs Lost
% of Abnormal Tenancies exceeds threshold		N/A	N/A	4, 5	FC-2	1	1	Warning	67.13	% Bad Tenancies
OPN Ended by Destination	000:15:48.912_169_163	1044xx (FL)	104a00	4, 5	FC-2	33	2	Warning	0	Credit Balance
Arbitration Loss by device	000:15:48.912_169_163	104a00	1044xx (FL)	4, 5	FC-2	36	5	Warning		
Out of Credits during Tenancy	000:15:48.912_211_275	1044xx (FL)	104a00	4, 5	FC-2	32	1	Warning	1	Times Out of Credit
Arbitration Loss by device	000:15:48.912_211_575	1044xx (FL)	104a00	4, 5	FC-2	36	5	Warning		
OPN Ended by Destination	000:15:48.912_304_838	1044xx (FL)	104a00	4, 5	FC-2	33	2	Warning	0	Credit Balance
Out of Credits during Tenancy	000:15:48.912_465_637	1044xx (FL)	104a00	4, 5	FC-2	32	1	Warning	1	Times Out of Credit
Arbitration Loss by device	000:15:48.912_468_113	1044xx (FL)	104a00	4, 5	FC-2	36	5	Warning		
Arbitration Loss by device	000:15:48.912_475_988	1044xx (FL)	104a00	4, 5	FC-2	36	5	Warning		
OPN Ended by Destination	000:15:48.912_502_538	1044xx (FL)	104a00	4, 5	FC-2	33	2	Warning	0	Credit Balance
Arbitration Loss by device	000:15:48.912_502_538	104a00	1044xx (FL)	4, 5	FC-2	36	5	Warning		
Out of Credits during Tenancy	000:15:48.912_544_762	1044xx (FL)	104a00	4, 5	FC-2	32	1	Warning	1	Times Out of Credit
OPN/CLS without frame transmission	000:15:48.912_611_325	1044xx (FL)	104a00	4, 5	FC-2	112	3	Warning	0	Credit Balance
OPN/CLS without frame transmission	000:15:48.912_616_200	1044xx (FL)	104a00	4, 5	FC-2	112	3	Warning	0	Credit Balance
OPN/CLS without frame transmission	000:15:48.912_621_113	1044xx (FL)	104a00	4, 5	FC-2	112	3	Warning	0	Credit Balance
OPN/CLS without frame transmission	000:15:48.912_679_463	1044xx (FL)	104a00	4, 5	FC-2	112	3	Warning	0	Credit Balance
OPN/CLS without frame transmission	000:15:48.912_684_338	1044xx (FL)	104a00	4, 5	FC-2	112	3	Warning	0	Credit Balance
OPN Ended by Destination	000:15:48.912_715_950	1044xx (FL)	104a00	4, 5	FC-2	33	2	Warning	0	Credit Balance
Out of Credits during Tenancy	000:15:48.912_758_137	1044xx (FL)	104a00	4, 5	FC-2	32	1	Warning	1	Times Out of Credit
OPN Ended by Destination	000:15:48.912_787_200	1044xx (FL)	104a00	4, 5	FC-2	33	2	Warning	0	Credit Balance
Out of Credits during Tenancy	000:15:48.913_593_488	1044xx (FL)	104a00	4, 5	FC-2	32	1	Warning	1	Times Out of Credit
OPN/CLS without frame transmission	000:15:48.913_622_625	1044xx (FL)	104a00	4, 5	FC-2	112	3	Warning	0	Credit Balance

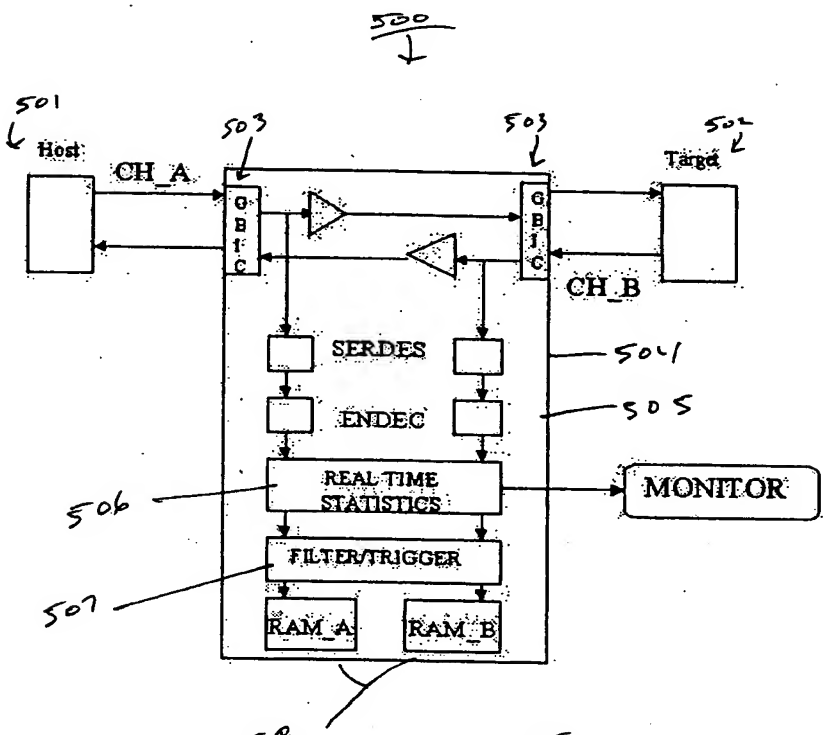

500
501
Host
503
CH_A
503
502
Target
GBIC
GBIC
CH_B
SERDES
504
ENDEC
505
REAL TIME STATISTICS
MONITOR
506
FILTER/TRIGGER
507
RAM_A
RAM_B
508

FIGURE 5

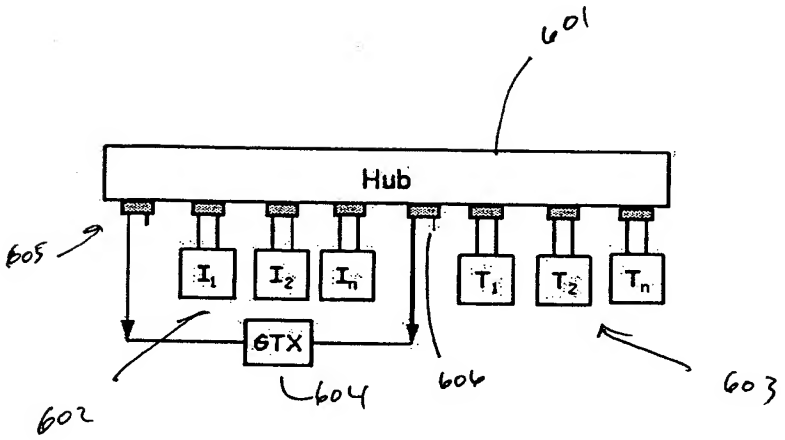


FIGURE 6

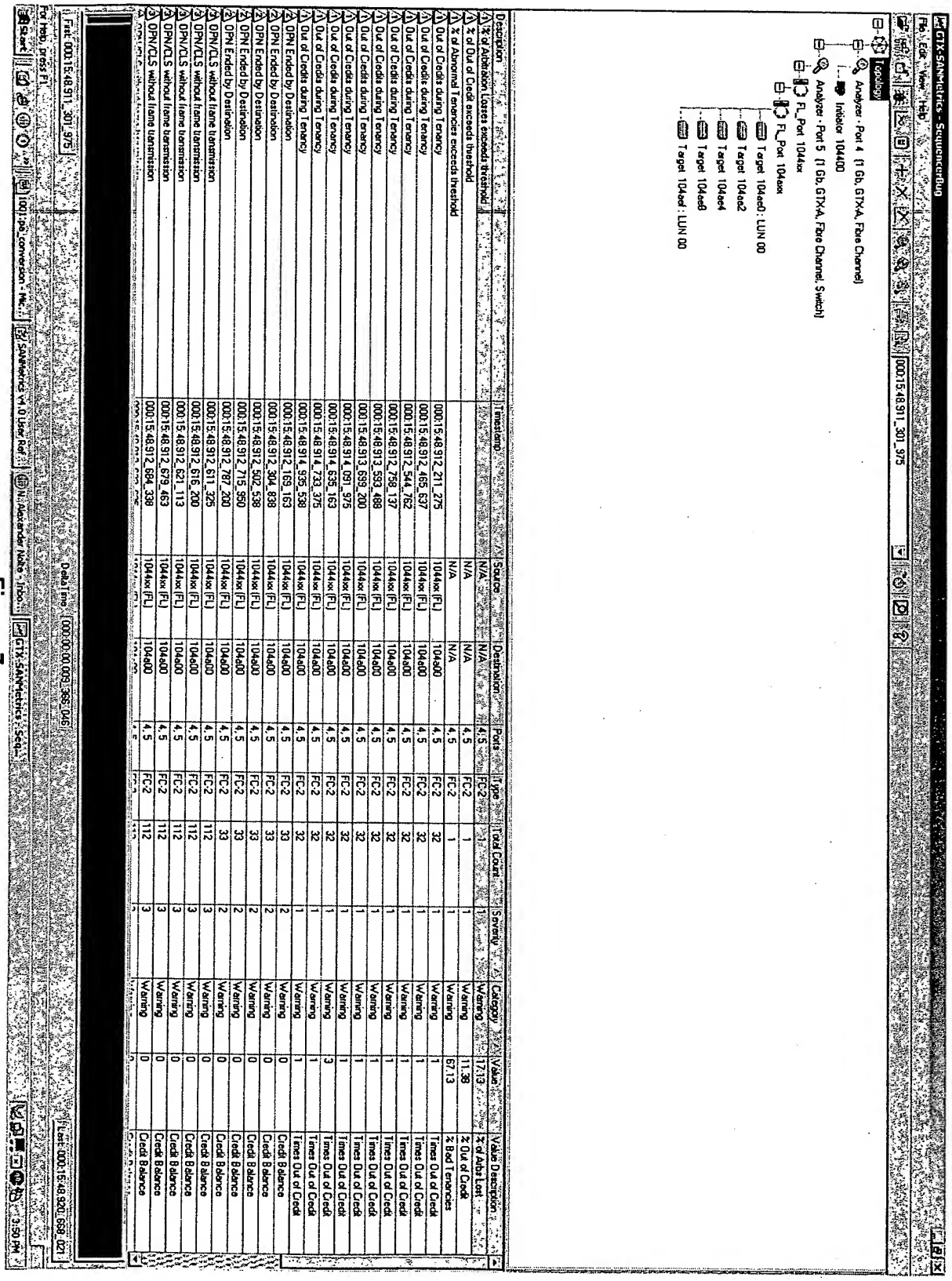

GTX-SANMetrics - SequencerRun
Topology
Analyzer - Port 4 (1 Gb, GTX-A, Fibre Channel)
Initiator 104400
Analyzer - Port 5 (1 Gb, GTX-A, Fibre Channel Switch)
FL_Port 1044xx
FL_Port 1046xx
Target 104ed0 : LUN 00
Target 104ee2
Target 104ee4
Target 104ee6
Target 104ed : LUN 00
Description
Timestamp
Source
Destination
Ports
Type
Total Count
Severity
Category
Value
Value Description
% of Abtsolution Losses exceeds threshold
% of Out of Credit exceeds threshold
% of Abnormal Tenancies exceeds threshold
Out of Credits during Tenancy
Out of Credits during Tenancy
Out of Credits during Tenancy
Out of Credits during Tenancy
Out of Credits during Tenancy
Out of Credits during Tenancy
Out of Credits during Tenancy
Out of Credits during Tenancy
Out of Credits during Tenancy
OPN Ended by Destination
OPN Ended by Destination
OPN Ended by Destination
OPN Ended by Destination
OPN Ended by Destination
OPN Ended by Destination
OPN Ended by Destination
OPN/CLS without frame transmission
OPN/CLS without frame transmission
OPN/CLS without frame transmission
OPN/CLS without frame transmission
OPN/CLS without frame transmission
OPN/CLS without frame transmission
OPN/CLS without frame transmission
% of Abts Lost
% Out of Credit
% Bad Tenancies
Times Out of Credit
Credit Balance
Delta Time
First: 000:15:48.911_301_975
Last: 000:15:49.920_668_021
For Help, press F1
Start
3:50 PM

Figure 7

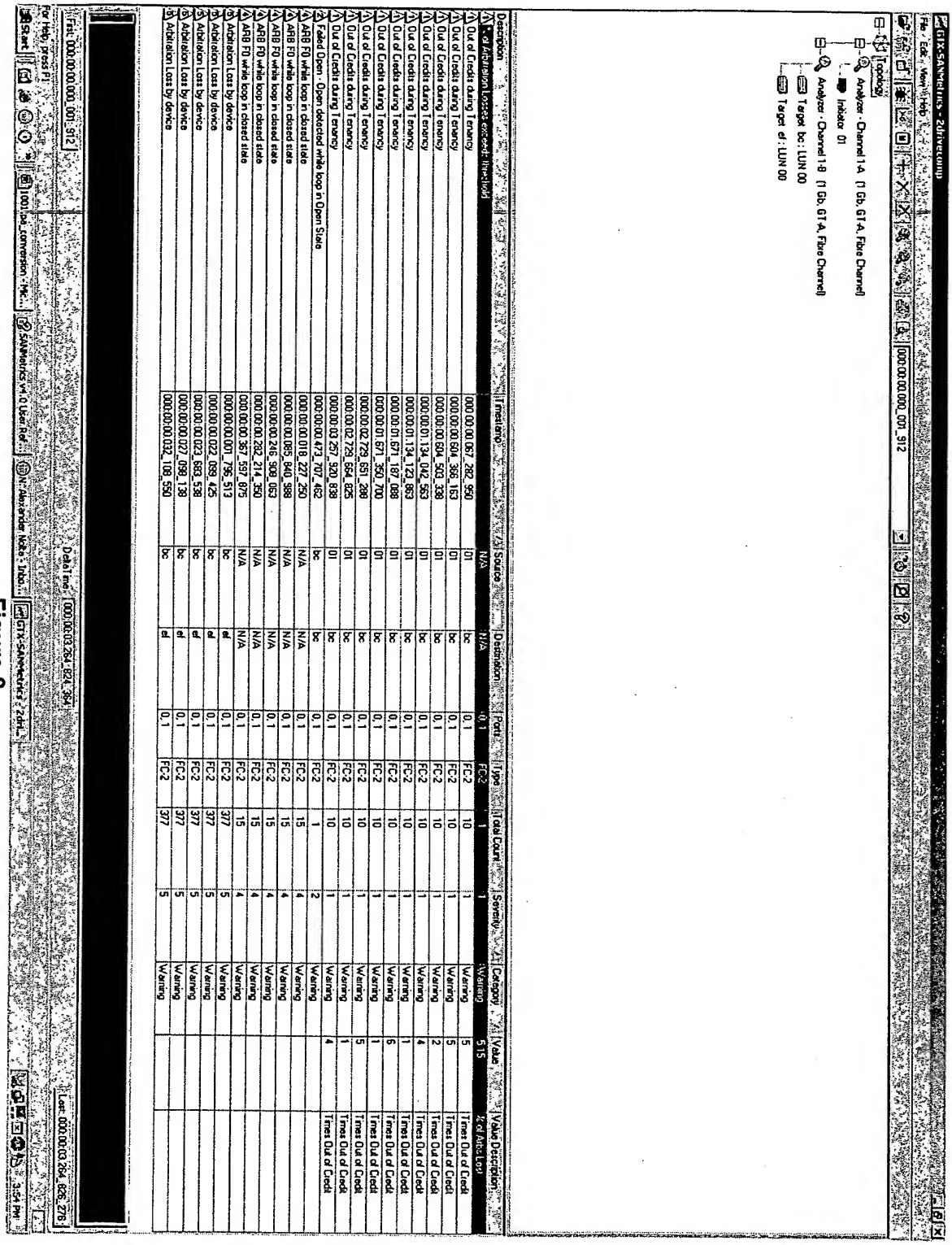

GTX-SANNetrics - 2driveGUI
Topology
Analyzer - Channel 1-A (1 Gb, GT-A, Fibre Channel)
Initiator 01
Analyzer - Channel 1-B (1 Gb, GT-A, Fibre Channel)
Target bc : LUN 00
Target d : LUN 00
Description
Timestamp
Source
Destination
Ports
Type
Total Count
Severity
Category
Value
Value Description
# of Arbitration Losses exceed threshold
000.00.00.067_282_950
Out of Credits during Tenancy
000.00.00.504_366_163
000.00.00.504_503_338
000.00.01.134_042_363
000.00.01.134_123_863
000.00.01.671_187_088
000.00.01.671_350_700
000.00.02.728_551_288
000.00.02.728_664_825
000.00.03.257_320_838
Failed Open - Open detected while loop in Open State
000.00.00.473_707_462
ARB F0 while loop in closed state
000.00.00.018_227_250
000.00.00.085_640_388
000.00.00.246_908_053
000.00.00.282_214_350
000.00.00.367_597_875
Arbitration Loss by device
000.00.00.001_796_513
000.00.00.022_089_425
000.00.00.023_583_538
000.00.00.027_098_138
000.00.00.032_108_550
N/A
bc
d
01
0,1
FC-2
Warning
5
15
2 of Arbit Loop
Times Out of Credi
DataTime:
000.00.03.264_824_384
First: 000.00.00.000_001_912
Last: 000.00.03.264_826_276
For Help, press F1
Start
1001bal_conversion - Mic...
SANMetrics v4.0 User Ref...
N:\Alexander Mike - Inbo...
GTX-SANNetrics - 2driv...
3:54 PM

Figure 8

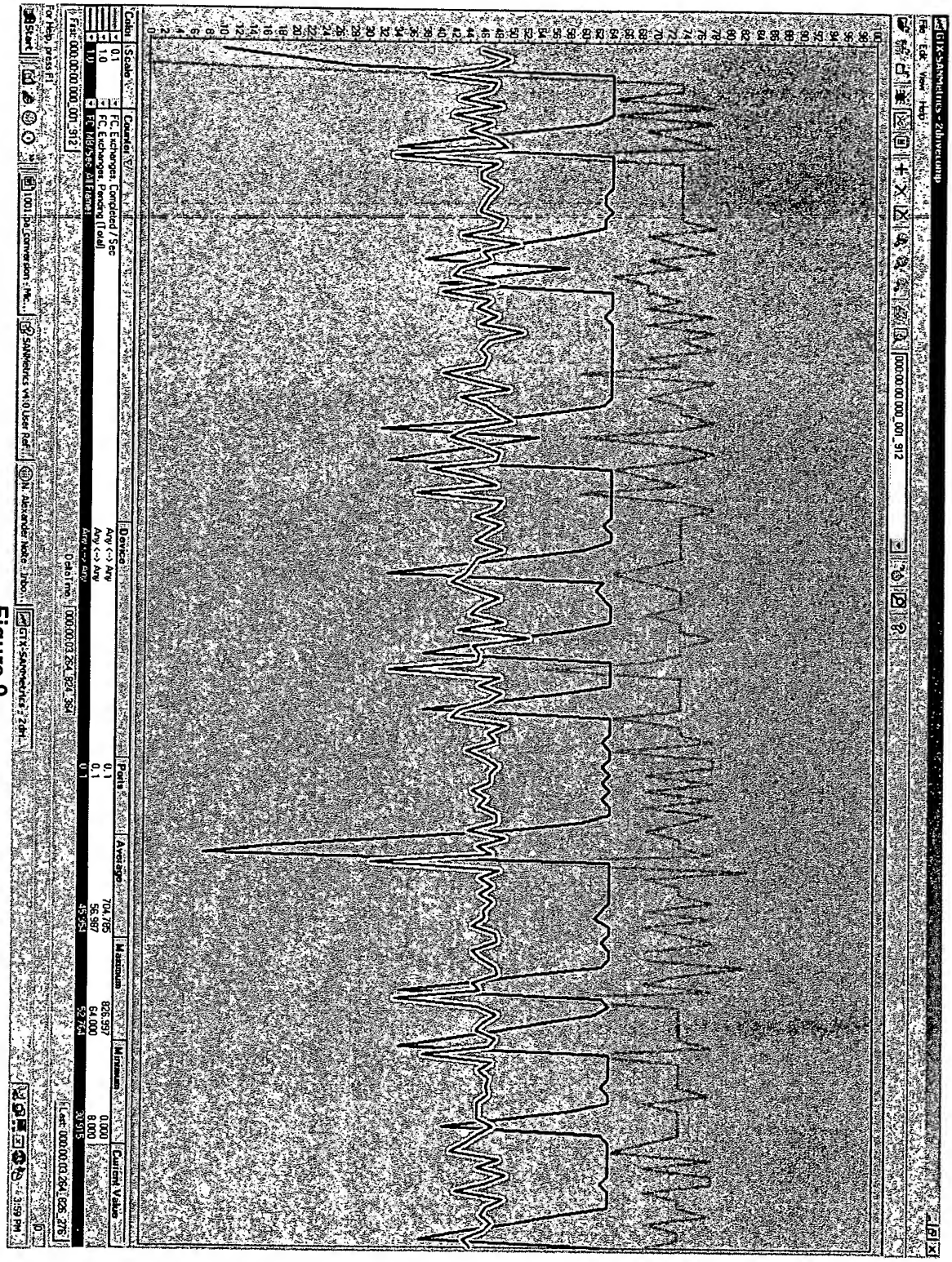


Figure 9

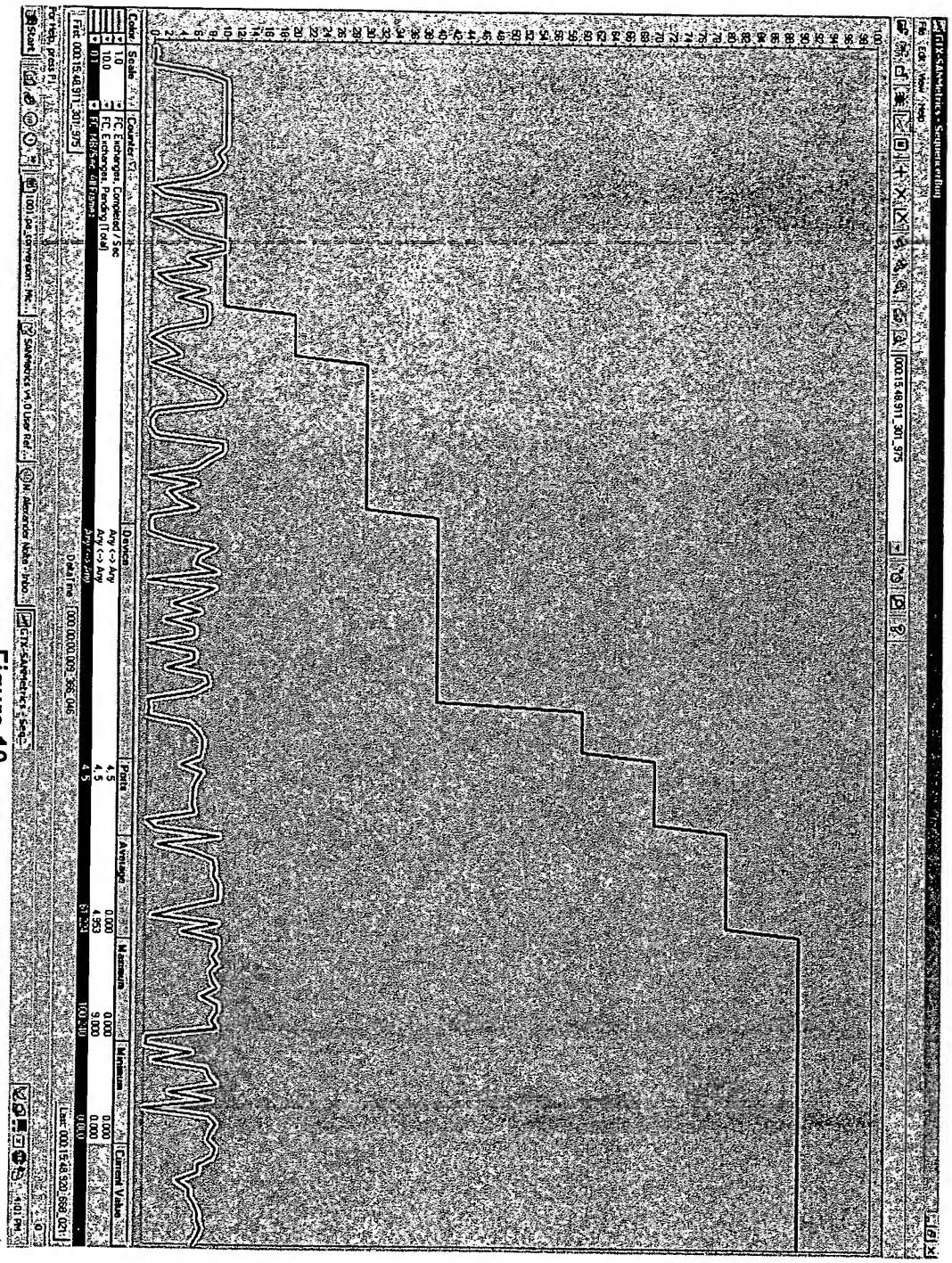
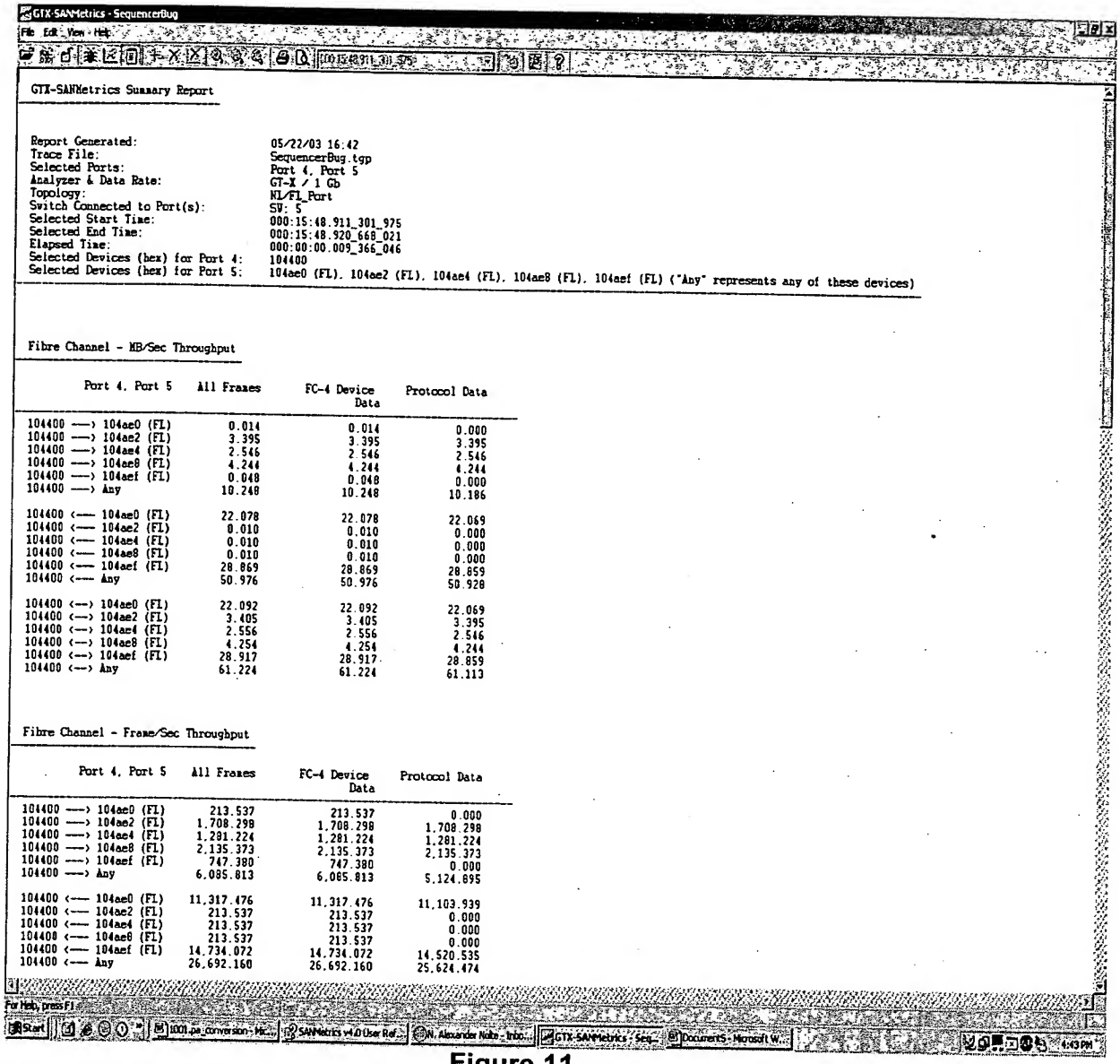


Figure 10



GTX-SANMetrics - SequencerBug

File Edit View Help

GTX-SANMetrics Summary Report

Report Generated:	05/22/03 16:42
Trace File:	SequencerBug.tgp
Selected Ports:	Port 4, Port 5
Analyzer & Data Rate:	GT-X / 1 Gb
Topology:	NL/FL_Port
Switch Connected to Port(s):	SW: 5
Selected Start Time:	000:15:48.911_301_975
Selected End Time:	000:15:48.920_668_021
Elapsed Time:	000:00:00.009_366_046
Selected Devices (hex) for Port 4:	104400
Selected Devices (hex) for Port 5:	104ae0 (FL), 104ae2 (FL), 104ae4 (FL), 104ae8 (FL), 104aef (FL) ("Any" represents any of these devices)

Fibre Channel - MB/Sec Throughput

Port 4, Port 5	All Frames	FC-4 Device Data	Protocol Data
104400 ---> 104ae0 (FL)	0.014	0.014	0.000
104400 ---> 104ae2 (FL)	3.395	3.395	3.395
104400 ---> 104ae4 (FL)	2.546	2.546	2.546
104400 ---> 104ae8 (FL)	4.244	4.244	4.244
104400 ---> 104aef (FL)	0.048	0.048	0.000
104400 ---> Any	10.248	10.248	10.186
104400 <--- 104ae0 (FL)	22.078	22.078	22.069
104400 <--- 104ae2 (FL)	0.010	0.010	0.000
104400 <--- 104ae4 (FL)	0.010	0.010	0.000
104400 <--- 104ae8 (FL)	0.010	0.010	0.000
104400 <--- 104aef (FL)	28.869	28.869	28.859
104400 <--- Any	50.976	50.976	50.928
104400 <--> 104ae0 (FL)	22.092	22.092	22.069
104400 <--> 104ae2 (FL)	3.405	3.405	3.395
104400 <--> 104ae4 (FL)	2.556	2.556	2.546
104400 <--> 104ae8 (FL)	4.254	4.254	4.244
104400 <--> 104aef (FL)	28.917	28.917	28.859
104400 <--> Any	61.224	61.224	61.113

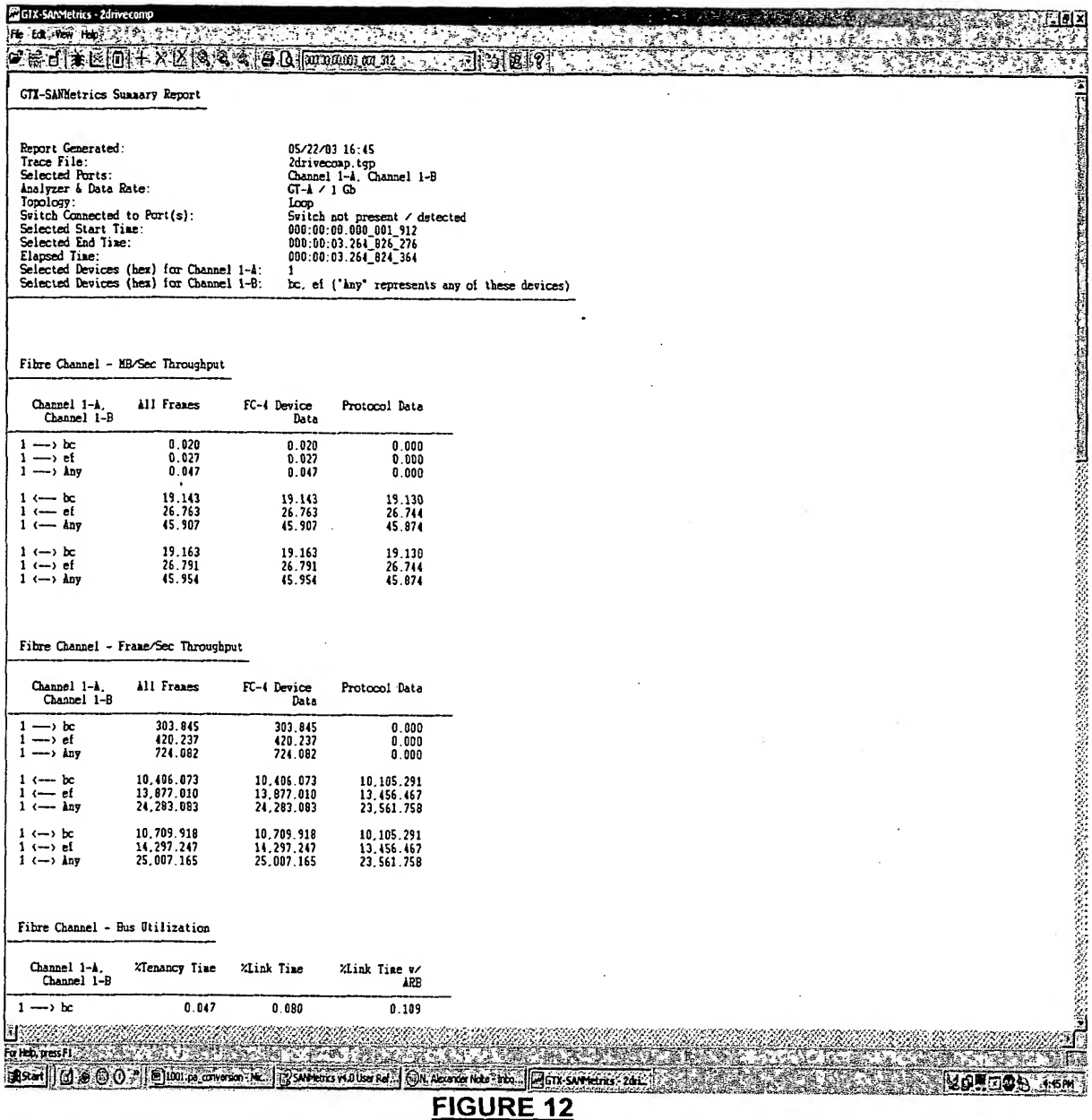
Fibre Channel - Frame/Sec Throughput

Port 4, Port 5	All Frames	FC-4 Device Data	Protocol Data
104400 ---> 104ae0 (FL)	213.537	213.537	0.000
104400 ---> 104ae2 (FL)	1,708.298	1,708.298	1,708.298
104400 ---> 104ae4 (FL)	1,281.224	1,281.224	1,281.224
104400 ---> 104ae8 (FL)	2,135.373	2,135.373	2,135.373
104400 ---> 104aef (FL)	747.380	747.380	0.000
104400 ---> Any	6,085.813	6,085.813	5,124.895
104400 <--- 104ae0 (FL)	11,317.476	11,317.476	11,103.939
104400 <--- 104ae2 (FL)	213.537	213.537	0.000
104400 <--- 104ae4 (FL)	213.537	213.537	0.000
104400 <--- 104ae8 (FL)	213.537	213.537	0.000
104400 <--- 104aef (FL)	14,734.072	14,734.072	14,520.535
104400 <--- Any	26,692.160	26,692.160	25,624.474

For Help, press F1

Start | 1001.pe_conversion - Mi... | SANMetrics v4.0 User Ref... | N. Alexander Nolte - Inbo... | GTX-SANMetrics - Seq... | Document5 - Microsoft W... | 4:43 PM

Figure 11



GTX-SANMetrics - 2drivecomp

File Edit View Help

GTX-SANMetrics Summary Report

Report Generated:	05/22/03 16:45
Trace File:	2drivecomp.tgp
Selected Ports:	Channel 1-A, Channel 1-B
Analyzer & Data Rate:	GT-A / 1 Gb
Topology:	Loop
Switch Connected to Port(s):	Switch not present / detected
Selected Start Time:	000:00:00.000_001_912
Selected End Time:	000:00:03.264_826_276
Elapsed Time:	000:00:03.264_824_364
Selected Devices (hex) for Channel 1-A:	1
Selected Devices (hex) for Channel 1-B:	bc, ef ("Any" represents any of these devices)

Fibre Channel - MB/Sec Throughput

Channel 1-A, Channel 1-B	All Frames	FC-4 Device Data	Protocol Data
1 ---> bc	0.020	0.020	0.000
1 ---> ef	0.027	0.027	0.000
1 ---> Any	0.047	0.047	0.000
1 <--- bc	19.143	19.143	19.130
1 <--- ef	26.763	26.763	26.744
1 <--- Any	45.907	45.907	45.874
1 <---> bc	19.163	19.163	19.130
1 <---> ef	26.791	26.791	26.744
1 <---> Any	45.954	45.954	45.874

Fibre Channel - Frame/Sec Throughput

Channel 1-A, Channel 1-B	All Frames	FC-4 Device Data	Protocol Data
1 ---> bc	303.845	303.845	0.000
1 ---> ef	420.237	420.237	0.000
1 ---> Any	724.082	724.082	0.000
1 <--- bc	10,406.073	10,406.073	10,105.291
1 <--- ef	13,877.010	13,877.010	13,456.467
1 <--- Any	24,283.083	24,283.083	23,561.758
1 <---> bc	10,709.918	10,709.918	10,105.291
1 <---> ef	14,297.247	14,297.247	13,456.467
1 <---> Any	25,007.165	25,007.165	23,561.758

Fibre Channel - Bus Utilization

Channel 1-A, Channel 1-B	%Tenancy Time	%Link Time	%Link Time w/ ARB
1 ---> bc	0.047	0.080	0.109

For Help, press F1

Start | 1001.pa_conversion - Mi... | SANMetrics v4.0 User Ref... | N. Alexander Note - Inbo... | GTX-SANMetrics - 2dri... | 4:45 PM

FIGURE 12